

**2<sup>nd</sup> U.S.-China NO<sub>x</sub> and SO<sub>2</sub> Control Workshop**  
**Opening Remarks**

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Good morning. My name is Scott Smouse and I manage the international programs at the U.S. Department of Energy's National Energy Technology Laboratory. I'm pleased to be here with you this week to chair the 2<sup>nd</sup> U.S.-China NO<sub>x</sub> and SO<sub>2</sub> Control Workshop. First, I would like to say that I'm pleased to be here in China once again and that we all have the opportunity to be together in such a beautiful place. I would like to take a few minutes to give my perspective on why we are here this week.

The availability of affordable energy is, and will continue to be, essential to world's economic development and growth. Energy forecasters agree that coal and other fossil fuels will be the dominant energy source for the foreseeable future. It is projected that the United States will still rely on coal for over half its electricity generation in 2020. Globally, developing countries, such as China, will also undoubtedly continue to use their abundant, domestic coal resources to fuel their economic growth, particularly when other options are in short supply or carry more risks or uncertainty when price or reliability of supply is considered.

Worldwide, the coal power generation industry faces the dual challenge of responding to growing concern of its impact on the local, regional, and global environment and the cost-cutting pressures associated with market deregulation and privatization. However, the economic need for sustained coal use must be balanced by improved technology to eliminate the adverse impacts that emissions can have on the environment. Current pollution control technologies for coal-fired power plants have proven effective at reducing emissions by a factor of two or three at low-incremental costs. For example, low-NO<sub>x</sub> burners are now installed in more than ¾ of all U.S. coal-fired power plants. The cost of controlling pollution today is lower than it was 20, 10, or even 5 years ago, and today's equipment is significantly more reliable and effective at reducing emissions.

Between 1970 and 2004, U.S. population has increased by more than 40 percent, U.S. gross domestic product by nearly 200 percent, and U.S. energy consumption by nearly 50 percent. During this period, emissions of SO<sub>2</sub> from coal-fired power plants were reduced by nearly 40 percent and NO<sub>x</sub> by about 10 percent while electricity generation using coal increased nearly three fold—showing that the environment can be protected while a country prospers using its own domestic energy resources.

These reductions could only have been achieved through the joint efforts of government and industry to invest in the research, development, and demonstration needed to bring improved, lower-cost technologies to the market. These investments have resulted in a wide range of combustion and post-combustion NO<sub>x</sub> control and flue gas desulfurization equipment that have improved air quality in the United States at acceptable costs and made U.S. companies the world leaders in technology innovation and major suppliers of environmental equipment to utilities around the world. Yet, we are not satisfied, we are hard at work developing even newer, better, cheaper technologies, not just for SO<sub>2</sub> and NO<sub>x</sub>, but also for particulates and

mercury, including multipollutant systems that can control emissions of all of these pollutants at once at lower costs so that coal can remove a competitive clean energy source.

As a country's economic prosperity increases, it will seek to upgrade the environmental performance of its energy systems. Since the passage of the Clean Air Act in 1963, the United States has made great progress in reducing the emissions of pollutants from coal-based power systems. In parallel, stricter environmental legislation in Europe and Japan has yielded similar environmental benefits. The United States, Japan, and Europe started major efforts to reduce SO<sub>2</sub> and NO<sub>x</sub> emissions from coal-fired power plants in the 1970's and 1980's. Other countries, such as Korea, started much later, in the 1990's, but were able to benefit from the earlier technology development and industry experience by installing the latest generation of pollution control equipment that had not only vastly improved performance characteristics but also significantly lower capital and operating costs. China is now in a position where its economic development necessitates the deployment of pollution control equipment in all sectors to protect its environment and citizens. However, China can benefit from all the technological improvements and cost reductions that have been achieved over the past 30 years and install the latest generation of pollution control systems, which are based on lower-cost, more-reliable, more-efficient technologies than were available even just a few years ago.

The McIlvaine Company, a U.S. environmental market analysis company, conservatively predicts that China will purchase more air pollution control equipment—\$6 billion—than any other country next year, even when considering China's lower cost of labor. About half of this of this total will be invested at existing and new coal-fired power plants to control SO<sub>2</sub>. McIlvaine estimates that worldwide orders for flue gas desulfurization system over the next 15 years will average at least \$4 billion per year with sales reaching nearly \$8 billion by 2007 with China purchasing \$22 billion over this period. Although I don't have market estimates for low-NO<sub>x</sub> burners and post-combustion NO<sub>x</sub> control systems, sales of such equipment in China are beginning to take off. China is even starting to equip a number of coal-fired power plants with selective catalytic reduction (SCR) systems – the most efficient technology to control NO<sub>x</sub> emissions available today. McIlvaine also estimates that the world market for air pollution monitoring and sampling systems and services, including power plant optimization systems, will exceed \$1.5 billion by 2008. China will become a big player in this market too.

Soon after signing a new agreement to cooperate on fossil energy in 2001, the U.S. Department of Energy and China's Ministry of Science and Technology agreed to invite U.S. vendors of NO<sub>x</sub> and SO<sub>2</sub> equipment to a workshop where information on our technologies, experience, and capabilities could be with shared with China. This workshop, which was held in November 2003 in Shenyang, was attended by 43 representatives of 9 U.S. companies. Following this workshop, I heard from several companies that received orders for their equipment from Chinese utilities or were able to enter into new business relationships with Chinese companies.

Since the first workshop, less than 2 years ago, to meet its growing demand for power, China has started building more coal-fired power plants than the United States has built in the past 50 years. The representatives from the Chinese utilities that are here this week are looking for cost-effective emissions control equipment for their power plants. The 16 U.S. companies that are here this week are the world leaders in supplying that equipment. Some of the U.S. companies here this week have been doing business in China for a long time, while others are

making their first visit. In addition to those here, I heard from several other U.S. companies about their interest in China, but they were unable to be with use this week as they are very busy with projects at home.

This workshop is just one of many joint activities that have been and will be conducted under the Fossil Energy Protocol between our two countries. I would like to thank Messrs. Xu Jing and Zheng Fangneng of the Ministry of Science and Technology, who are here today, for their unwavering support of our bilateral Protocol and this workshop. Lastly, I would especially like to recognize and thank Mr. Li of NPCC and Mr. Wang of CEC and all of their staff for all their hard work in preparing for this event.

I look forward to a productive workshop over the next 4 days and know that the information that will be shared and the relationships that will be formed will help China improve its environment while creating business opportunities for U.S. companies.